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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

1st named inventor: Michael Stuart Weaver

Serial No.: 10/712,492

Filed: 11/13/2003

Title: METHODS AND STRUCTURES FOR REDUCING LATERAL DIFFUSION THROUGH COOPERATIVE BARRIER LAYERS

Art Unit: 2813

Examiner: Schillinger, Laura M.

Docket No.: UDC-20201 CON

Confirmation No.: 8333

Mail Stop Appeal Brief-Patents
Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

APPEAL BRIEF UNDER 37 C.F.R. §1.192

As set forth in the Notice of Appeal filed by first-class mail on July 28, 2005, Appellants hereby appeal the final decision of the Examiner in the above-identified application rejecting claims 44-55.¹ Appellant respectfully requests that the Board of Patent Appeals and Interferences reverse the Examiner's rejection of the claimed subject matter.

¹ The examiner has not addressed pending claims 56-58, which were added in Appellant's Amendment and Response dated February 15, 2005.

I. BRIEF ON APPEAL

This appeal is from the examiner's final rejection of April 28, 2005.

II. REAL PARTY IN INTEREST

Universal Display Corporation is the assignee of the present invention and the real party in interest.

III. RELATED APPEALS AND INTERFERENCES

No other appeals or interferences within the meaning of 37 CFR 1.912(c) are known to Appellant, Appellant's legal representative, or the assignees, which will directly affect, be directly affected by, or have a bearing on the Board's decision in the pending appeal.

IV. STATUS OF CLAIMS

The presently pending claims are claims 44-58.

A copy of claims 44-58 is provided in the attached Appendix.

Claims 44-55 stand finally rejected under 35 U.S.C. 102(e) as being anticipated by Silvermail US 6,576,351.

V. STATUS OF AMENDMENTS

The claims have not been amended subsequent to the final rejection.

VI. SUMMARY OF INVENTION

The invention is adequately described in claim 44, the only independent claim as follows:

44. An organic optoelectronic device structure comprising:

 a substrate;

 an organic optoelectronic device disposed over said substrate, said organic optoelectronic device selected from an organic light emitting diode, an organic electrochromic display, an organic photovoltaic device and an organic thin film transistor; and

 a barrier region disposed over said organic optoelectronic device, said barrier region comprising a plurality of cooperative barrier layers, said plurality of cooperative barrier layers further comprising a planarizing layer and a high-density layer, wherein said high-density layer is disposed over said planarizing layer in a manner such that said high-density layer extends to said substrate layer and, in conjunction with said substrate layer, completely surrounds said planarizing layer.

Advantages of the claimed invention relative to the prior art are the following.

Organic optoelectronic device (OLED) structures are produced in a fashion so as to provide an effective barrier between the OLED and the ambient atmosphere, reducing adverse effects due to chemical species in the ambient atmosphere, such as moisture and oxygen.

Lateral diffusion of moisture and oxygen within the barrier layers of OLED devices, which diffusion creates problems, is reduced.

VII. ISSUES

Is the subject matter of the appealed claims anticipated, i.e., described, in the Silvermail patent.

VIII. GROUPING OF CLAIMS

The claims have not been argued separately.

IX. ARGUMENT

The following legal authorities are relied on in the following argument in the order in which they are cited:

Richardson v. Suzuki Motor Co., 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

In re Marshall, 578 F.2d 301, 304, 198 U.S.P.Q. 344, 346 (CCPA 1978).

MPEP 2131.

Paperless Accounting, Inc. v. Bay Area Rapid Transit System, 804 F.2d 659, 231 U.S.P.Q. 649, 653 (Fed. Cir. 1986).

The reference

Silvermail discloses organic OLED structures that are represented in Figure 6, referred to by the examiner, as follows.

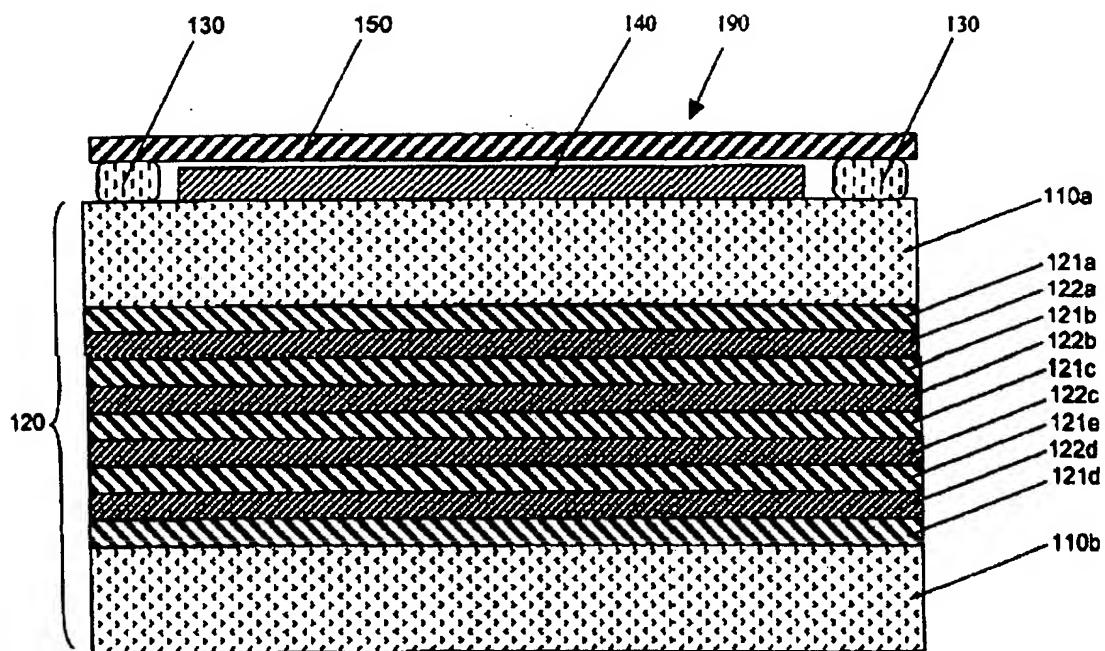


Fig. 6

Rejection

Claims 44-55 have been rejected under 35 U.S.C. 102(e) as being "clearly" anticipated by Silvernail.

The definition of the reference numerals for Figure 6 of the reference can be found at column 5, line 53 to column 8, line 48. They will be explained in greater detail here. Numeral 140 represents an OLED *per se*. Numerals 110a and 110b are substrate layers. The cooperative barrier layers in reference Figure 6 are represented by numerals 121a-d and 122a-d, and cumulatively by 120. The layers 121 and 122 represent, respectively, the planarizing material layers (e.g., polyacrylates) and the high density material layers (e.g., silicon or aluminum oxides). Numeral 130 is an adhesive layer (described as a ring similar to a gasket), which is an epoxy resin, for example, and 150 is an additional barrier material, such a metal, a silicon wafer, a ceramic or low-permeability polymer. Layer 150 is not comprised of a planarizing layer and a high density material layer. It is a unitary layer.

In Silvernail, there is at least one substrate, at least one barrier region comprising a plurality of cooperative barrier layers that comprise at least one planarizing layer and at least one high-density layer, and a further barrier layer. However, what Silvernail does not disclose includes the recitation in the last four lines of instant claim 44 that "said high density layer is

disposed over said planarizing layer in a manner such that said high-density layer extends to said substrate layer and, in conjunction with said substrate layer, completely surrounds said planarizing layer."

The above quoted limitation is the crux of the here claimed invention. It is responsible for the advantages described in the "Description of The Invention." That structural limitation is not found in Figure 6 of the reference, referred to by the examiner or anywhere else in the reference. For a reference to anticipate a claim, it must disclose each and every element of the claim. *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989), *In re Marshall*, 578 F.2d 301, 304, 198 U.S.P.Q. 344, 346 (CCPA 1978). "Disclose," in this context, means that the reference "must sufficiently describe the claimed invention to have placed the public in possession of it." *Paperless Accounting, Inc. v. Bay Area Rapid Transit System*, 804 F.2d 659, 231 U.S.P.Q. 649, 653 (Fed. Cir. 1986).

The examiner's position is that barrier layer 150 in the reference "may be construed as one of multiple cooperative barrier layers and which is also formed over the OLED" and that "layer 150 in combination with layer 120" anticipates the claims. The examiner has also referred to the reference at column 7, lines 1-10.

However, the improvement, which is recited in the last four lines of claim 44, is nowhere disclosed in the reference, and the examiner's construction of the combination of features 150 and 120 as anticipating the claims is erroneous.

Specifically, in the device of the reference, barrier 150 is unitary and does not comprise a planarizing layer and a high density layer. In appealed claim 44, however, it is recited that the barrier region is disposed over the OLED and comprises a plurality of layers that further comprise a planarizing layer and a high density layer. Thus the barrier region 150 in appealed claim 44 is quite different from, the single unitary layer in Silvermail.

Moreover, appealed claim 44 has further requirements for the disposition of the planarizing layer and the high density layer. In particular, as noted above, claim 44 further recites that "said high-density layer is disposed over said planarizing layer in a manner such that said high-density layer extends to said substrate layer and, in conjunction with said substrate layer, completely surrounds said planarizing layer."

In Figure 6 of Silvermail, the unitary barrier layer 150 does not extend to the substrate layer illustrated.

Moreover, in Silvermail, the ends of both the planarizing layers and the high-density layers (which, it should be pointed out, form part of the *lower* barrier 120) are exposed, as seen in Figure 6 of Silvermail. The planarizing layers are thus exposed to the external environment. The drawbacks of such an arrangement are discussed in paragraphs [0038] to [0040] of the present specification. Those drawbacks are that exposure to the edges of barrier layers corresponding to 121a-d and 122a-d, and particularly the planarizing layers, permits lateral diffusion of moisture and oxygen. The diffusivity of the planarizing layers is greater than that of the high density layers. By separating at least one planarizing layer from the outside environment by at least one high density layer, the claimed invention overcomes those drawbacks.

For that reason the reference device differs significantly from the here-claimed devices, and does not reduce lateral diffusion of moisture and oxygen in the planarizing layers as is done in the devices of the claimed invention.

The requirements of a reference as an anticipation have been set forth above. From the foregoing comparison of the devices of the appealed claims and those of Silvermail, it is clear that those requirements have not been met, i.e., each and every element of the present claims is not disclosed in the reference.

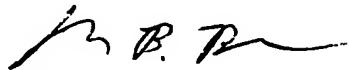
X. CONCLUSION

Silvermail does not disclose each and every element of the appealed claims. Thus, it is respectfully submitted that reversal of the rejection of record is in order.

XI. FEES

The Office is authorized to charge any fees due and owing in respect to the filing of this paper to deposit account number 50-1047.

Respectfully submitted,



David B. Bonham Reg. No. 34,297

Certificate of Mail

I hereby certify that this document is being deposited with the US Postal Service as first class mail under 37 C.F.R. 1.8 and addressed to: Mail Stop Appeal Brief - Patents; Commissioner for Patents, PO Box 1450; Alexandria, VA 22313-1450 on

11/3/03

Marjorie Scariati
(Printed Name of Person Mailing Correspondence)

Marjorie Scariati
(Signature)

APPENDIX

1 - 43. (Cancelled)

44. (Previously presented) An organic optoelectronic device structure comprising:

a substrate;

an organic optoelectronic device disposed over said substrate, said organic optoelectronic device selected from an organic light emitting diode, an organic electrochromic display, an organic photovoltaic device and an organic thin film transistor; and

a barrier region disposed over said organic optoelectronic device, said barrier region comprising a plurality of cooperative barrier layers, said plurality of cooperative barrier layers further comprising a planarizing layer and a high-density layer, wherein said high-density layer is disposed over said planarizing layer in a manner such that said high-density layer extends to said substrate layer and, in conjunction with said substrate layer, completely surrounds said planarizing layer.

45. (Previously presented) The OLED structure of claim 44, wherein said plurality of cooperative barrier layers comprises two or more planarizing layers and two or more high-density layers, and wherein each overlying cooperative barrier layer that is disposed over one or more underlying cooperative barrier layers extends to the substrate in a manner such that said one or more underlying cooperative barrier layers are surrounded by said substrate and said each overlying cooperative barrier layer.

46. (Previously presented) The organic optoelectronic device structure of claim 44, wherein said cooperative barrier layers comprise an alternating series of two or more planarizing layers and two or more high-density layers.

47. (Previously presented) The organic optoelectronic device structure of claim 46, wherein said alternating series comprises 3 to 7 planarizing layers and 3 to 7 high-density layers.

48. (Previously presented) The organic optoelectronic device structure of claim 44, wherein said planarizing layer comprises a material selected from fluorinated polymers, parylenes, cyclotenes and polyacrylates.

49. (Previously presented) The organic optoelectronic device structure of claim 44, wherein said high-density layer comprises a material selected from metal oxides, metal nitrides, metal carbides, metals and metal oxynitrides.

50. (Previously presented) The organic optoelectronic device structure of claim 44, wherein said high-density layer comprises a material selected from silicon oxide, silicon nitride, aluminum oxide, indium tin oxide and zinc-indium tin oxide.

51. (Previously presented) The organic optoelectronic device structure of claim 44, wherein said organic optoelectronic device is an OLED device.

52. (Previously presented) The organic optoelectronic device structure of claim 44, wherein said substrate is a rigid substrate.

53. (Previously presented) The organic optoelectronic device structure of claim 44, wherein said substrate is a flexible substrate.

54. (Previously presented) The organic optoelectronic device structure of claim 44, wherein said substrate comprises a metal foil.

55. (Previously presented) The organic optoelectronic device structure of claim 44, wherein said substrate comprises a rigid glass layer.

56. (Previously presented) The organic optoelectronic device structure of claim 44, wherein said organic optoelectronic device is an organic electrochromic display.

57. (Previously presented) The organic optoelectronic device structure of claim 44, wherein said organic optoelectronic device is an organic photovoltaic device.

58. (Previously presented) The organic optoelectronic device structure of claim 44, wherein said organic optoelectronic device is an organic thin film transistor.